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I.—Field-notes on the Birds of Kerguelen Island.

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MANY of my readers are probably aware that Kerguelen, also called the Island of Desolation, is situated in the South Indian Ocean, on the 50th parallel of latitude, and nearly equidistant from Africa and Australia. Lying within the Antarctic drift-current, as well as being entirely destitute of trees and shrubs, and mostly snow-clad, the avifauna of Kerguelen is limited (with two exceptions) to Orders that are able to exist without vegetable food. The two species which occupy a somewhat anomalous position on the island are the Duck and the Sheathbill, the latter being the only bird in the list which is not web-footed.

I took advantage of a summer expedition made in the sealing-brig 'Edward,' by the invitation of Mr. Hans Gundersen, and accompanied those who were engaged in commercial enterprise, in order to do what I could towards an increase of knowledge of the fauna and flora of this island, the largest uninhabited area at a distance from any continent.

Capt. Cook commenced the work here in 1776, and Sir James Ross continued it in 1840. In 1874 expeditions to watch the "Transit of Venus" were sent to Kerguelen by Great Britain, Germany, and the United States, and the

best work was done at that time. The expedition of H.M.S. 'Challenger' in the same year followed. Dr. Bowdler Sharpe (Phil. Trans. vol. clxviii.) has published a summary of the work in ornithology done up to 1879.

We visited the whole eastern coast of ninety miles, except Christmas Harbour; but with only seven weeks on land (from Dec. 28th, 1897, to Feb. 13th, 1898) to devote to the varied work of collecting and observing plants and animals, minute attention could be given only to Royal Sound and Greenland Harbour.

With a favourable and warm season, I was able to collect skins of more birds than any one of the previous expeditions, and I added two to the list of 33 species given by Dr. Sharpe as found on the island. But, prior to reading this paper, it would be well to consult the reports of Dr. Kidder* and the Rev. E. C. Eaton† ("Transit of Venus"), to which this paper is chiefly supplementary. It may be added that Mr. Selater has referred in 'The Ibis' to two or three of these species observed since 1879 in much higher latitudes.

The nomenclature here adopted is chiefly that of the 'Catalogue of Birds in the British Museum.'

PHALACROCORAX VERRUCOSUS (Grant, Cat. B. xxvi. p. 393).

My remarks on this Cormorant relate principally to five small rookeries, which were placed along one cliff a few hundred yards in extent. The birds were so tame that they walked up to and surrounded you, sometimes so closely that, when photographing a group, it was necessary to drive them back, in order that a good view might be obtained. One usually looks upon this family as "handy" with their bills, and, for myself, I keep out of range; but when my friend Mr. Evans‡ put his pocket-knife between the mandibles of one, the bird did not bite, and when he tried his fingers, at my wicked suggestion, even then no harm

* Miscell. Coll. Smithsonian Institution, vol. xiii. (1877).

† Phil. Trans. vol. clxviii. (1879).

‡ Subsequently in the South Polar Seas with the 'Southern Cross,' as Naturalist.

ensued. Only when actually pushed off the cliff-side did the birds take wing.

In the rookery the pairs belonging to each nest show mutual and constant attention, one standing and the mate sitting, while both fondle with the bill and occasionally preen each other's feathers. When a Great Skua Gull flies above a rookery in search of something to eat, there is a rising of necks and a low chorus of calls. The Skua knows the danger in a bite from the strong beak, and keeps out of reach, while it struts among the nests to find an egg exposed. At a fatal moment the Skua observes the Cormorant leave its nest, and at that instant is down and carries off a fresh egg, which is quickly cracked and swallowed whole. The Skua has the audacity to stay in the rookery, where the loss of an egg does not appear to cause any special commotion among the other birds. On that side of the rookery on which a Skua stands all birds are "faces front," and according as the position changes all the white portions of the plumage of the Cormorants are towards you, then all blacks, or, again, a blend of blacks and whites. The largest rookery observed contained about 180 birds, sitting or standing, and, with the exception of some eight immature examples, they appeared to be in the dress of maturity. The young birds were without the orange caruncles. The nests, 45 to 50 in number, each contained two or three eggs, rarely four. When I disturbed one bird from its nest, another would come and steal the lining. In passing through the closely-packed rookery the birds objected to being pushed from their nests, but offered no resistance beyond that of their own weight. A typical nest measured 13 inches extreme diameter, 8 inches across internally, with a depth of 3 inches; the lining was of marine weeds. From this rookery, for food and natural-history purposes, we carried away some 75 eggs, leaving a few clutches only (January 1st). On the 3rd of February I again visited the same rookery, and observed that the few remaining eggs had been hatched, while the young were now rapidly developing. All the soft portions of the other nests had been entirely taken away by the birds, and this part of

the hill-side now appeared as if a hard brush had been passed over the place. If fishes are plentiful here, it is only a Cormorant that can catch them, for, in fact, the only fish I got I stole from a Cormorant.

A very young bird, long before leaving the nest, I found to be troubled in the same way as the adult, by having worms in the stomach.

Of the three stages that I noticed, the featherless young on December 31st, 1897, was jet-black, excepting the pink under the chin. The fledgeling, on January 6th, 1898, was black, with a tinge of grey on lower portions; forehead featherless; chin slate-blue; bill blue-black, with anterior portion horn-blue; feet brownish black, with a tinge of blue next the claws, which were blue, with tips black. Iris paler blue than in adult. In the young, when able to fly, on February 8th, 1898, the plumage varied from dark brown to metallic blue; back of neck, chest, and abdominal parts showed white; legs and feet had a faint wash of brick-red over all; bill dark bluish on lower mandible. The yellow caruncles had not yet appeared, but I noticed the yellow showing as the black feathers were moulted from the ventral surface.

While fresh eggs were in a rookery (January 9th), young, several weeks old, were maturing in other nests of the same colony. Mr. Eaton collected fresh eggs in the middle of November, and I saw them in several rookeries between the 8th and 10th of January. On the 15th of that month a large colony was about to leave its dwellings, and on February 16th the nests in a fair-sized rookery had just become tenantless, though the birds still stayed about the spot. Neither before nor after did I observe any white on the transalar fascia, although I saw hundreds of mature birds. Of the eggs, several showed such small measurements as—(a) 2.7×1.6 inch; (b) 2.05×1.55 inch; and an abnormal one had its diameter 1.2, axis 1.8 inch.

DAFILA EATONI (Sharpe); *Salvad. Cat. B.* xxvii. p. 278.

Although this Duck is shy at times, it is also of an inquiring mind. On January 26th Mr. Gundersen and I had been

investigating the local distribution of the seals, and, having finished our lunch, we were surprised to see a flock of 18 Ducks rise in the distance and settle close to us, and when we sank into a "dip," almost hidden from their view, they actually walked to the edge and looked into our faces. When I was alone the birds were not at all shy, for it was to my advantage to go along so quietly that I always wandered among their families without giving them much concern. Occasionally I would flush one, and knew then that its anxiety was for the rest; or, if it feigned to be wounded, its device was to save a duckling, though, as a rule, the young one knew how to protect itself in the grasses. I followed one old bird for 150 yards, merely to test its deluding power, and then it gaily flew away.

I was interested in seeing Ducks at work along the tiny brooks, raising all the grass in an area of about 30 or 40 yards in search of food, or following the quickly-falling course to unearth the tender roots. I noticed them principally on low ground; they were not so numerous at greater elevations, such as Thumb Peak, 1500 feet. On the wing the note is a quack, or rather a wheezing noise. The Ducks are scared by the Skua, and rise at once when one flies over them; but the Skuas do not seem to catch them, for I never saw any of their remains. Yet they are timid birds, as I judged by noticing the effect of a falling rock below a cliff; they stretched their necks, and for some time did not continue to feed, while other species were not in the least concerned. Many nests were found in patches of *Acaena*, where they were nicely sheltered below the leaves. Dr. Kidder has observed that the eggs were generally covered with grasses by the birds when they left the nests. This applies to his finds in patches of *Azorella*, where the precaution is necessary; but among the *Acaena* it is not needed, owing to the springy nature of the grass. The eggs were never covered before the nest was left. Only the sides and edges of the nests were made of down, as a rule; the exception was merely a hollow, scantily or not at all feathered. Generally the nests are carefully hidden, but in two cases the eggs were quite exposed, with very little down around them (December 28th). One

was on the top of a clump of *Azorella*, exposed to the Skuas, according to the account given by one of our young men. The nest is made to accommodate the number of eggs. If three eggs belong to it, the internal diameter is 5 inches; if four, the diameter within is 7 inches. In two cases, on February 2nd, at Betsy Cove, the clutch of hard-set eggs was only two. When the young are hatched they remain for some time on the high land, far from any water. The specimens that I obtained were preserved.

CHIONARCHUS MINOR (Hartlaub); Sharpe, Cat. B. xxiv. p. 711.

I found the Sheathbill congregating in numbers, varying from half a dozen to 14, but I once saw an isolated pair. This shore-loving bird is a pest alike to Penguins and Cormorants. One of my photographs shows an adult Penguin about to feed a young one nearly of its own size. Both are standing in company with a Sheathbill, and just as the young Penguin is bending forward to take a dainty morsel from the mouth of the parent, the Sheathbill jumps upon its shoulders, both bend forward, and the longer neck secures the prize. The second case is rather more serious; for, having disturbed a pair of Gulls from their nest, I started to photograph the subject. In the meantime a pair of the Sheathbills came up and quietly pecked a hole in one egg; naturally the chick called out; the hole was then increased and the chick hauled forth, and piece by piece eaten in a few minutes. All this time the very shy Gulls were looking on. The same kind of apparent crime takes place with the Cormorants. One pair of Sheathbills always haunts a rookery, and, going quietly in and out among the Shags, they pick up what they can. Eggs they go straight for, and they seem grateful to a stranger who disturbs the colony, for then comes their special opportunity. I have seen the Sheathbills walking round a nest of feathered young Cormorants as if they expected to be allowed to take a bite from the wing of a young one, and they would have done so, if no defence had been made. While seated on a thoroughly uncomfortable rock, one of a pair approached me.

It pecked at some hard biscuit, but could do nothing with it; then I blew out a scrap or two from my mouth, but the noise seemed strange to the bird and it retreated; soon it came back, tried one of the scraps, but did not swallow it; next it attacked my boot, but left immediately and again tried the scrap of biscuit; after which, with one or two close looks into my face, it walked away. These typical acts of inquisitiveness lasted from 10 to 15 minutes. A sudden meeting with a few of these birds does not seem to frighten them. I surprised 12 of them at one time, but they simply gathered round me. If I moved my legs, the birds quivered a little, but immediately recovered themselves. A Sheathbill does not indulge in eight hours' consecutive sleep, as I judge by having had one staring into my face in the early hours of the morning, for at least an hour, it seemed to me, while camped beneath a rock. This bird is knowing enough to put its own eggs under cover, and will either get well into the rock-crevices or use a burrow made by one of the larger Petrels, if one is to be found close against a great boulder. The eggs, which vary, are always exposed to the light near the entrance, and are deeply coloured. As soon as the sitting parent hears a noise near the nest it jumps off to see what is the matter, and just as quickly does the young one get away from the nest into some hiding-place. This accounts for seeing so many empty nests in February.

The nest is circular, neatly made of seaweed, or sometimes grasses, if grass be near. One nest, made of roots of *Azorella*, was placed 30 inches down in a Petrel's tunnel, some 7-10 inches from the house-path of nearly every nest. The pair referred to previously chose a mile of beach without large rocks, consequently they used a Petrel's earthy nest in the cliff—the only one like this in a dozen nests found by me.

My first find of eggs, three in number, was on the 29th of December, but eggs were mostly fresh until the 27th of January; on February 13th the eggs had well-developed embryos. I found the first young one on January 29th, in one of some 20 nests observed on Hog Island, in Royal Sound. This nestling was bluish, intermixed with brown down; legs and feet bluish; nails black; bill dark

horn-colour, with tips of mandibles cream. The eggs were generally two and sometimes three in number, but occasionally there was only one. The measurements of 15 specimens ranged between 2.2×1.5 inch and 2.4×1.6 . As a large series of eggs shows much variation, I give below the descriptions of four types :—

(a) Creamy-white ground, with small, thin, purplish blotches appearing as if beneath the surface. On this surface are light to deep brown irregular blotches of nearly the same size, occupying about one fifth part, and being more numerous towards the larger end.

(b) Base creamy white, with streaky grey-slate smears on it and some heavy brown blotches. The ground-colour is visible only on about one third portion of the egg.

(c) Creamy-white ground, with bold blotches, varying from black to brown.

(d) This and the preceding (c) are the standard types of some 30 eggs observed by me. In *d* the ground-colour is light brown, and the irregular blotchings of umber-brown vary from light to dark. Less than one half of the ground-colour is visible to the eye.

MEGALESTRIS ANTARCTICA (Lesson); Saunders, Cat. B. xxv. p. 319.

More details of the field-life of the Great Skua have been written than on any other bird of the island, yet there are more to follow. When one bird tries to kill and eat its wounded mate, and a pair promptly did eat one of their own young ones which had been killed, it will be agreed that the term "Vulture-Hawk" is not misapplied to it. Both these occurrences were observed by the writer. Like previous observers, I was, at first, continually mistaking this web-footed bird for a Hawk. It pesters all other birds while on the wing, and the rabbits are harassed beyond endurance. I have seen it worrying Albatrosses and Petrels at 1100 miles from shore, to the eastward of Kerguelen. There the Spectacled Petrel made its clear treble notes heard in protest, and the Mollymawks (*Diomedea melanophrys*) would settle upon the water to escape further molestation.

As for any danger that rabbits might overrun the land, the Skuas settled that point long ago. I know that the Skua is a good rabbitier, for not only did Mr. Gundersen and Mr. Brechen see a rabbit being carried through the air and a Skua doing battle with a full-grown one, which, however, escaped, but also I counted six dead rabbits under a stone at the mouth of their burrow. As for skeletons, they were everywhere, and appeared far more numerous than the living animals. I never saw a live rabbit unless it was running straight for a definite point, so dreaded is this Skua and so quick are its movements. As for stealing the spoil of our guns, it was incorrigible. At lunch one day, with a freshly-killed Duck lying behind one of the sportsmen, a Skua stole quietly up and ate the flesh and nearly every bone of it, and all this within five feet of us. On another occasion, two of our men, with the second officer, wounded two Ducks. One of these was about to be picked up, when down swooped a Skua. It was at once severely struck on the back, and that Duck was dropped, but, continuing its flight, the Skua seized the other Duck and escaped.

So interested is the Skua when gorging itself on a seal, that it goes in head and shoulders, and soon becomes of a sanguine colour: so unconscious of surroundings is it on these occasions that one was caught with the hand. Another was trying to keep its place upon a living seal's back, while the animal was endeavouring to bite it and shake it off; but perhaps the seal had a wound on its back filled with crustaceans, as was the case with one which we had previously observed. Large pieces of seal's flesh are swallowed by the Skua on the wing. It jerks a piece upwards to get a better hold, and then gulps it down; while, if the prey be too large to be carried far, the bird will settle on the water or the ground, and although Gulls flock round, there is no interference. With the Gulls, in fact, the Skua agrees very well.

A photograph of a Skua sitting on its nest was taken as if at the bird's own request. I had focussed the eggs, and was about to open the shutter, when the Skua settled upon the eggs within five feet of me. The nest is rude, and measures 15 × 12

inches, with a depth of 4 inches. Broken bones and eggs are scattered around it, but not in any ornamental way. The young are without spots in the fledgeling stage. They are early taught to leave the nest on signs of danger, when they will crouch in the grass a few yards away. In this stage they are brownish grey, with black bill and slate-coloured legs. When the young are nearly as large as the parents, and are ready to learn to fly, they exercise their legs by jumping directly upwards a few inches, with wings expanded against the wind, and this antic is accompanied by a jerky, continuous, and plaintive high note. Most of the nests contained young birds by New Year's day. One nest was supported by a whaler's wooden tomb-memorial on Grave Island, Royal Sound. I did not notice any yellow on the nape and neck of the young, indicative of a connection with the *M. maccormicki* of the Antarctic region proper.

LARUS DOMINICANUS Licht. ; Saunders, Cat. B. xxv. p. 245.

Royal Sound is the principal haunt of the Southern Black-backed Gull, and no other harbour here compares with it for numbers. I say this after visiting the most important shelters on the east and south-east coasts, where we found this Gull far from plentiful. The killing of seals soon affords a sure indication of the relative abundance of this species, as at this season the birds of each fjord keep to themselves. I think they fear to venture far out in the open, for they are not very strong on the wing, and when a storm arises they invariably float on the water, keeping within the kelp, which grows a mile out from the beaches. In this way hundreds may be seen, riding-out a gale. For variety of position the bird will stand for some time upon the kelp, and to do this it does not fold its wings for a while, but, like a boat under sail, it will incline forward, until a sure footing on the weed is obtained. It maintains the usual reputation of the sea-bird for clamour, and the clear echo of its calls may be heard resounding from the heavy basalt cliffs of Murray Island.

The young crouch on the rocks for evasion when a human being passes, and the whole flock call from above as if they

had the melancholies. Even when the young birds are as large as their parents they hide under rocks for protection, but soon become impatient and start for the water. So dark in colour are some, that one of our men took one for a young Skua; but others show a lighter mottling. I think the birds hatched in December assume a dress similar to the adult about February to March, but not so much contrasted. On December 27th the young were scarcely noticeable amongst a flock. On January 17th they were plentiful on the wing. On February 15th I noted a flock of some fifty young marbled birds, and they were then more numerous, though not so conspicuous as the adults. I conclude that the young assume the plumage of the adult in one season.

Previous expeditions have noted eggs as early as October 14th, and I found them fresh as late as January 16th. This latter "find" was on a small, low, flat island next to Suhm's Island. From it we gathered seventeen fresh eggs and observed thirty nests. Four of the nests had each one egg (not unusual), most had two eggs in them, and two had each three eggs. One clutch of two had one heavily and typically blotched, while the other was quaintly scrolled. On this islet of a few acres there were no Sheathbills, which would be a relief for Gulls, and there were no Petrel-holes, so it was quite a Gulls' paradise, although an occasional Skua visited it. The nests were in the seaweeds just above the high-water mark, with one exception which lay in the grass in the centre of the island. Usually I found the nests placed upon flat rocks sheltered partly by others.

• STERNA VIRGATA Cabanis; Saunders, Cat. B. xxv. p. 50.

This little Tern does not go far out to sea, and it is a taker of crustaceans rather than of fishes, the latter being distinctly scarce. Upon observing the repeated dives of some of these Terns I asked a gunner to shoot three, and found upon dissection that they contained small rectangular-shaped crustaceans in abundance; but along with other birds even the Terns came down to taste seal's flesh and seemed to relish it. I generally observed them in flocks of about a dozen, but on January 26th I was interested to see forty birds in two

divisions, closely associated. These were early breeders. At 8.30 p.m., in company with Skuas, they would pass our anchored ship in their wanderings over the waters of the harbour, and until the sun set they showed little inclination to retire to slumber.

The Tern is very watchful of its egg, and I have seen two Skuas driven away by it, first one and then the other being attacked. Our captain, Steensohn, shot a Duck which fell dead into a lake, and the Terns kept on pecking at its body until the wind carried it beyond the vicinity of their nests. I found them breeding upon high ground, several hundred yards from a beach, as well as only a few yards from high-water mark, and they not only place their nests in different positions but construct them in different styles. These are commonly placed upon a flat bed of sand and rocky ground, more rarely upon a sandy part of the beach, but on one occasion among the *Acaena* plant without a nest (February 7th). The sandy and rocky ground afforded hollows for the single egg, in each case; while on the shelly beach the nests were of dry stalks of seaweed. A saucer-like nest of this description had a full diameter of 4 inches, with a depth of 1 inch. Fresh eggs were gathered up to January 18th, on which date seven specimens were obtained; and on this day I observed eggs in place of those taken by me on December 30th. On January 4th I saw the first mottled young one flying with a flock; its call was different from the harsh treble note of the adult, and was a pleasant short trill. On January 25th in Greenland Harbour I noticed a young bird that had lost all its barred feathers, and had the head, bill, and feet black; otherwise it was much like the parents, and by next spring the "soft parts" would be red. The second officer of the ship assured me he had just seen (January 27th) a black bird in many respects like this Tern and associated with it. Its plumage was lustrous black, and so were its bill, legs, and eyes, but such a bird I did not meet with.

DIOMEDEA CHIONOPTERA Salvin, Cat. B. xxv. p. 443.

This great Albatross is whiter and even more elegant than *D. exulans*. My first observation of it was in a harbour.

There seemed to be a squabble on the water for food, and while the little Wilson's Petrels gave way to the Cape Petrels, the latter, in their turn, yielded place to the Black-browed Albatross, yet all moved away for this great bird, apparently impressed by the strength of its bill.

Fig. 1.



Diomedea chionoptera on its nest.

Altogether Kerguelen Island possessed five species of the family, four of which followed the ship at one time, and I observed colonies of three species.

This bird at home is an entertaining host, and I was delighted to make the acquaintance of one with its wife and

family under very favourable circumstances. It is quite sociable, and those off duty are specially communicative when they have nothing else to do. A pair will face each other and engage in a conversation that is hoarse but not jarring; and this they vary considerably, going to the lowest and trying to get to the highest notes without spoiling the effect. It is certain that they like to communicate with each other while they are gracefully standing or walking. One day I was basking in the sunshine on a hillside, watching fifteen sitting Albatrosses on the slopes of some hillocks facing each other (see fig. 1, p. 13). Occasionally a bird would alight after a little wheeling, but with widely parted legs to make sure it would come down correctly. Albatrosses may be ungainly on a ship's deck, but they are very majestic in their nesting-places, and I could not but admire their stately walk. My attention was attracted by a group of four birds which were gracefully billing each other. Now and then one would extend its wings as if to embrace the other, while afterwards they would sit down opposite and bill again. Two of these were birds of last year, and two were adults, while on two nests within a few yards adults were sitting. This family circle charmed me, and I at once put away the story of how old birds cruelly drive away young ones from the nests, when the latter are old enough to leave. Here were the eggs of this year, the young of last year, and, presumably, the parents of both. I have seen an adult run thirty yards with fully extended wings and then leave the level ground, while another ran only three paces with outspread pinions before rising from the flat ground. The feathers of the immature birds in this group were dark on the crown of the head, while those on the back and head were not pure white but like those of *D. exulans*; though otherwise these birds of one year old were similar to their parents in appearance. The birds now incubating were in the quartette arrangement or in pairs, so that they always had company to talk to and to bill with. In each set there were young birds. Later on I saw eight birds closely assembled, four of which I considered mature and the other four young. One was quite brown, with perhaps a little

white on the face, but the others were blotched with sombre colour on their necks. Here were four nests with sitting birds within one hundred yards, so that four families were amicably engaged in the task of incubation and enjoying meanwhile each other's company.

In the month of February, out at sea (102° E., 43° S., February 2nd, 1898), I noticed an Albatross which looked like a link between this uniformly brown young bird and the almost mature white-necked one. It was dark brown, except the bill, face, cheeks, and throat, which were white, with two white lines of feathers in the wings close to the body as it floated on the water; the under sides of the wings had two wide bands of bluish-white and black. It was a piebald bird, and the only one seen by me throughout the trip. This was most likely a last season's bird, late in its moult, but not so late as the very brown one. These three stages may be normal, and probably are such. As to how the young learn to fly, my opinion is that they simply tumble out of the nest and practice their legs and wings until they can fly from the flat ground. The nests are promiscuously placed, and cliffs are less favoured than undulating ground near a low beach. When a Skua hovers above them, the sitting birds look defiant and clatter their mandibles.

In three distinctly large colonies, and also in isolated pairs, the nests were usually within 50 feet above sea-level. The largest group was near Mount Campbell, where we handled some 80 eggs and observed many more in the distance. On Howe Island, off Kerguelen, I examined some 30 nests with eggs. At the Prince of Wales's Foreland were more than 25 nests; while solitary nests were noted on Long Island, in Royal Sound, and on the adjacent southern beach.

Several of these nests were quite hidden from a view of the sea, and extended inland half a mile, where ridges and small freshwater lakes intervened. They are made up of peaty grass interwoven with fibrous earth. A typical nest measured: breadth 37 inches, diameter of bowl 18 inches, depth of bowl 5 inches. The floor of this bowl would be

about 2 inches deep, as all was simply matted with the natural short grass, and appeared as if merely placed upon it. Many nests are raised $1\frac{1}{2}$ feet. Some have well-trimmed sides of earth and are conical, but they are in the minority. Nests of last year still remained among those of the present, and some of those tenanted were simply additions to those of the past season. The nests may be within two yards of each other to the number of three or four, but generally they are many paces apart, and continue in a line along the higher grounds of the beach.

On the 15th of February I observed some 30 nests, all with half-incubated eggs. The first fresh eggs were noted on New Year's day in a rookery of 25 nests, but several nests were still without eggs on the 3rd of January. Two of the sitting birds photographed were not mature. In one case the back was barred, and in the other the wing-coverts were far from being white. I observed sitting birds in three stages of plumage, in what I would be inclined to think the second, third, and fourth years of age. The skin prepared by us does not quite agree with Mr. Salvin's description in his key (Cat. B. xxv. p. 440), for the scapulars are not "faintly banded," while the only flush of pink on the bird was over the left eye, and even this was scarcely visible. The above-mentioned skin I presented to the Hon. Walter Rothschild for his museum.

On the 15th of January an egg was taken from a nest, and eight days later I saw the bird still sitting on its nest. It seemed a long business. When eggs are taken from the nests, the birds quietly get on again and continue to sit. One egg weighed 1 lb., and measured 5.25 inches by 3.20 inches, and this was the largest found. A smaller egg was broken in the nest by one of the ship's crew, and forty-eight hours later I observed that the bird was still sitting with its feathers damped and soiled. The date was written on this egg, and it may remain a long while in the nest. We found the male bird taking part in the incubation. On the bird killed and preserved on February 14th several lice remained alive in the plumage, until they were bottled on March 23rd.

DIOMEDEA MELANOPHRYS Temm.; Salvin, Cat. B. xxv. p. 447.

The Black-browed Albatross seems to me to have a voice like the bleat of a sheep. Near the South Head of Greenland Harbour an opportunity was given me to see a magnificent rookery of this species. The cliff faced the east, and was, roughly, over 700 feet high. The birds were dotted upon it to a height of about 400 feet, where an incline led to it; but in other directions the cliff looked precipitous, bold, and forbidding. I counted 40 to 50 birds in a flock on the water, just in front of the nesting-ground; but this number was proportionately very small, and there must have been from 500 to 700 birds in the mass of whitened spots. Individuals flew off and on, associated into groups and separated, lodged on the water and quickly left it, all the time displaying their very elegant flight. Although I had spent three days in visiting the islands and the mainland, in search of this rookery, I could not see it until I was sailing within a few hundred yards, and quite opposite it*.

Captain Steensohn hooked two of these Albatrosses for me. One was caught by the leg through quarrelling with another; while the second was captured by the beak, which does not often occur, owing to the bird's bump of caution, for the bait is nearly always dropped at the first pull and the barb of the hook does not usually hold. On throwing a large piece of fat overboard, I noticed that each time the bird tugged at it the open wings jerked forward and the tail flicked upward. Although this mass of birds was so near a large harbour, more than three or four were seldom seen inside it at one time, and very few appeared 30 miles west of the colony. From this I concluded that this Albatross is very local in its distribution, and finds its food straight out from the shore.

We kept one alive on board from 5 A.M. to 8 A.M., and when released it joined a mate with apparent good humour

* [The discovery of a breeding-place of this species is interesting, inasmuch as the Black-browed Albatross was not ascertained by the 'Challenger' Expedition to nest on Kerguelen, although two specimens of it were obtained there.—EDD.]

and rested upon the sea. At this time of year "billing" is the order of the day, and this is a strong characteristic of the Albatrosses of these waters. There is a bond of sympathy between the birds, judging from the fact that one wounded in the wing by us in the harbour had swum round to the rookery (about three miles), and was there found resting upon the water, unable to fly. The others left it when we approached.

THALASSOGERON CHLORORHYNCHUS (Gm.); Salvin, Cat. B. xxv. p. 451.

Of the Yellow-nosed Albatross I saw no nests; but birds were observed near the entrance to the harbour of our last anchorage (Fuller's). Suitable lofty islets were near this coast, and the birds in adult plumage would probably be breeding there, or on the cliffs to the southward of Christmas Harbour. This species makes an addition to the list of Kerguelen birds.

PHŒBETRIA FULIGINOSA (Gm.); Salvin, Cat. B. xxv. p. 453.

In its adult stage the Sooty Albatross is well known to naturalists. Its habits upon the hills at the time of nidification require no particular mention. A trumpet-like screech and cat-like noise seem to be the vocabulary of this bird, as it wends its curving flight along the face of the cliffs, in the lower parts of which it places its nest. January 5th saw me investigating three nests on Murray Island in Royal Sound. Two were within three feet of each other, while the third was several hundred yards away, but all were placed under ledges of rocks some 300 feet high and facing the sea. The first nest contained an egg which was undoubtedly addled, as I became aware when blowing it, and so were the other persons in the cabin; yet upon this egg the bird still sat. Two nests placed together contained, respectively, a young bird a few days old, and an egg with an almost matured embryo. This egg I took, and five days later I annexed the young of the other nest. All this time the egg-nest was still being sat upon by the Sooty Albatross. The young one, when left by its parent, stood up to assert its

rights, and snapped its bill in the manner of the adult, but feebly. A Cormorant's fresh egg, partly broken, was near, so the little gallant lived well in the start of its career, and disgorged enough food in a mass to give a meal to half a dozen ordinary birds. The general hue of the nestling was slate-colour; the bill slate-black; legs bluish; iris faint hazel, and pupil blue. The ring of white had begun to show round the eye. The nests were neat, saucer-like, and of fine fibrous loam, caked. The dimensions were:—breadth 17 inches, diameter of cavity 12 inches, depth of cavity 3 inches, depth of structure about 4 inches.

These observations were made on January 5th. I was not able to recognize Prof. Hutton's subspecies *P. f. cornicoides* (Ibis, 1867, p. 186) in these sitting birds, although, later on, I observed some on the wing that appeared to be greyer on the back and abdomen. At sea, some 300 miles east of Kerguelen, I noticed (February 20th) many specimens with the nape of the neck white, and I think these were immature birds.

OCEANITES OCEANICUS (Kuhl); Salvin, Cat. B. xxv. p. 358.

The yellow-webbed Wilson's Petrel is a delicate creature that goes straight to sea in the early morning, and comes back to the rocks in the gloaming. Most of my time was spent among the stones below 1000 feet, where this Petrel is to be found in great numbers by diligent search. At 1500 feet (Thumb Peak) one flew from the boulders in the daytime, which showed that a nest was there. Having returned from the sea into the harbours at dusk (8 P.M.), Wilson's Petrel is then to be seen, flying to and fro before a ridge of rough-looking rocks. At 6 P.M. I observed (February 2nd) a gathering of from 50 to 60 birds off the South Head of Greenland Harbour. Generally they are unassociated until they come in towards night. They are seldom to be seen on land in the daytime, and I only once noticed a bird flying up and down a part of a valley of stones, more than a mile from the sea, and a creek, which led from this highland, had encouraged the bird to go there. It reminded me of a Martin

collecting insects. Having sat down to finish a piece of buttered rye-bread, I observed the bird alight on a jutting mass of loose stones, and this led me to remove the stones from the entrance to the nest and to discover a delicate egg.

At about 8 P.M. the croaking begins, for now the "night-shift" has come in from the sea to go on duty. Many congratulations seem to be exchanged. Go straight to a wild-looking piece of the coast if you want nests. Look under large or small slabs of stone or within the crevices in the cliff-sides. Most of the nests are saucer-like, and neatly put together with loose twigs. Your shovel will act as a lever to lift the slabs and expose them, when the sitting bird will move away to the farthest corner to escape the light, never offering to bite, although the act would be harmless. At 7 A.M. I have found the male bird sitting on the egg, indicating, in this case, that it will sit out the day. A male also flew on board on one occasion during the night, which probably meant that it had a mate sitting on the nest. Thus the male possibly sits either day or night. At 8 P.M. I have taken both male and female from a nest which was in an earthen bank and had an entrance and an exit.

The nests of this species were built principally of *Azorella*-stalks. They were flat, in a shallow indentation beneath a stone, and had no definite tunnel running to them. The bird would sometimes scratch an entrance. A typical nest measured 7×5 inches, and the depth of the bowl was 5 inches. On handling a bird, it will (like other Petrels) eject a fatty globule, for a distance of 2 feet. I used to track the sitting birds between 8 and 10 P.M. by their strong but mellow note. One evening's search produced seven nests containing young and eggs. The eggs differ very slightly in size: six measured $1.3 \text{ in.} \times 0.9 \text{ in.}$ On February 3rd I found three eggs (fresh and hard-set); on 7th, 8th, and 9th, four fresh eggs, seven young nestlings, and two hard-set eggs; on the 14th one hard-set egg. The egg has an almost true oval form, slightly wider towards one end, around which was a circle of pale pink spots. The nestling was covered with a uniform greyish-black down. Bill black; legs bluish, tinged with

faint yellow; webs bright yellow; toes faint black; nails black. The parents sit with the young during the night.

We found this species numerous in all the five harbours visited by our brig.

CYMODROMA MELANOGASTER (Gould); Salvin, Cat. B. xxv. p. 364.

I was not able to find the nesting-place of this Petrel, but it was somewhere at the north-west end of Royal Sound, and our ship lay at the opposite corner while in this harbour. The bird was seen at both ends of the island, but not in the same numbers as the yellow-webbed Wilson's Petrel.

MAJAJUEUS ÆQUINOCTIALIS (Linn.); Salvin, Cat. B. xxv. p. 395.

Our first sight of the Spectacled or White-chinned Petrel was 280 miles due north of Kerguelen island.

On Murray Island, in Royal Sound, while watching Teal, I saw an example of this Petrel pass and repass several times a small waterfall, and, to my astonishment, it finally settled down in the shallow water and waded under the ledge of the bank. A little digging in this thoroughly sodden ground brought me to the nest, and I soon found out that a White-chinned Petrel bites severely. The male bird takes part in the incubation in the daytime, but also leaves the egg to itself for a considerable time while in the early stage of development; and this I observed also in Greenland Harbour.

Besides cephalopods, the food of the birds seems to be kelp, which I noticed on opening one specimen. Gould remarks that the yellow markings on the bill of this Petrel are particularly defined in Australian specimens. I observed that one of our Kerguelen birds had yellowish-blue horn-colour predominating over most of the bill, with a ridge of black along the lower mandible, and one-third of the upper mandible from the nostril was also black.

There is a peculiarity in the breeding of the bird. Of eleven nests found only one was in dry ground; the others were in hill-sides, down which snow-water ran at all seasons of the year. The earth was simply saturated with water,

and in it were tunnels, always beginning under a small cascade, and running back for a distance varying from 5 to 8 feet. In one instance I dug 11 feet to reach the egg. The holes are in groups of from three to six, judging from four colonies examined by myself. At the end of a crooked tunnel is a semi-spherical cavity with a flat floor covered with water, and in the middle of this space is a raised circular bed of rootlets, saucer-like, inverted, with an indent just above the water-level. In this nest lies the single egg, measuring about 3.4 by 2.2 inches. The diameter of one cavity surrounding the nest proper was 22 inches one way and 19 inches another, the height 6 inches; and of the nest proper the diameter was 13 inches. Broken sprigs of grass in water at the tunnel entrance are indicative of occupancy. Dr. Kidder obtained a young one on September 15th, and an egg on December 16th.

Early in February I secured fresh eggs, but found that by January 27th most of the eggs were much incubated, while some nests contained young. In three examples of the nestling the down was uniform slate-brown on the throat. The sitting birds in three cases had white chins only, while a fourth had white blotches on the cheeks. Throughout our sojourn on or near the island I did not see a typical Spectacled Petrel. I may mention that, like Dr. Kidder, I saw birds flying about without any of the white on the chin which is characteristic of this species. I distinctly observed one (as it settled to pick up scraps of seal-meat near the ship) which looked exactly like *M. parkinsoni* of the New Zealand seas, a species which has not been hitherto recognized as a frequenter of Kerguelen.

PRIOFINUS CINEREUS (Gm.); Salvin, Cat. B. xxv. p. 390.

Specimens were not obtained, but these birds often wheeled astern of the brig; more after the style of the Albatross than that of the smaller Petrels. One, when we were stopping from full speed to pick up something from the water, showed blotches of yellow on the under webs of the toes, which were rapidly opened and shut, but otherwise it presented the recognized characters of the Great Grey Petrel.

CESTRELATA LESSONI (Garnot) ; Salvin, Cat. B. xxv. p. 402.

My first notice of this rare white-headed Petrel was on the 30th parallel, immediately to the north of the island. "Mutton-birding" in Kerguelen is quite a different matter from what it is in Victoria. In the first place, a hooked stick is of no use, as the holes are never straight, and, as they penetrate to some 5 feet distance, the digging is difficult work ; besides, the nests are few and far apart.

I found that both sexes of this species take part in incubation in the daytime, a male sitting in one case and females in others. From a nest which contained a nestling I took a parent bird, which spat at me in a very nasty way from its bill. It has not been recognized as usual with this Petrel to attend its young in the daytime. Cuttle-fish seem to be the favourite food, as I always extracted a large quantity of tiny mandibles from the very small stomachs of these Petrels.

As I had gathered from Dr. Sharpe's report on the birds of this island that the coloration of the foot of this species had not been carefully recorded, I noted in January the following colours in seven birds :—Outer toe : all digits ebony-black. Middle toe : prox. digit flesh-white, the other two digits black, but not so black as those of the outer toe. Inner toe : prox. digit flesh-white, distal digit nearly so, with a trace of black down the centre. Webs : (a) between outer and middle toes the distal half is brownish black, the prox. half is flesh-colour ; (b) between middle and inner toes the distal one-fifth is brownish black, the prox. four-fifths being flesh-colour. Nails horn-black.

Nesting takes place on dry ground on the mainland or islets, up to 100 feet above the sea-level. I got to know the homes of this species by finding feathers loosely strewed along the floor of the tunnel, and occasionally twigs of *Acaena* or dry *Azorella* in small quantities.

In nine nests found previously to 28th January all the eggs contained well-developed embryos ; but a few days later I procured an egg that was tolerably fresh. On the 29th

I unearthed two very young birds, one of which was attended by its parent.

In Royal Sound on 15th January I blew an egg that was thoroughly sour and without any sign of development. This I took from under the bird.

I did not observe any of the nests to be raised, for they were in dry ground and did not need it. The egg was merely placed on a few gathered soft fibres and an occasional feather.

The smallest of ten eggs measured 2.7×2 in., the largest 2.95×2.05 in.; the average was 2.85×2 in.

The general colour of the downy nestling is bluish-grey; bill—posterior half black, anterior light violet; legs and feet waxy pale, webs flesh-colour, digits bluish, nails horn-black.

ÆSTRELATA MACROPTERA (Smith); Salvin, Cat. B. xxv. p. 399.

This is Gould's *Procellaria atlantica* and Buller's *Æ. fuliginosa*, and is now noted for the first time as an inhabitant of the island. It seems to lay itself open to the attacks of the Skuas more than any other Petrel, excepting the Prion, for I found nine dead birds at the mouths of their burrows in various parts of the dry and higher ground of the beach. I saw this species only at Long Island, near the entrance to Royal Sound, and on the Prince of Wales's Foreland.

ÆSTRELATA BREVIROSTRIS (Less.); Salvin, Cat. B. xxv. p. 409.

On January 25th, in Greenland Harbour, I dug out a hollow that branched in two directions at 5 feet from the entrance. One tunnel went in for another 6 feet, and contained at the end a Spectacled Petrel (*Majaqueus æquinoctialis*) upon a nest without an egg. The other branch had a dome-shaped cavity some 18 inches from the confluence, in which sat a Short-tailed Petrel without an egg. The nest indicated that the bird was a fully-fledged young one. On squeezing its breast there was no resistance, and not even a cry was uttered.

ÆSTRELATA MOLLIS (Gould); Salvin, Cat. B. xxv. p. 406.

Specimens were not obtained, but the birds often accompanied the brig. So far as I could recognize the species

while on the wing, the band across the chest shows several variations in depth of colour.

OSSIFRAGA GIGANTEA (Gm.) ; Salvin, Cat. B. xxv. p. 422.

My best opportunities of watching the Giant Petrel were in the rookeries (see fig. 2), and on the feeding-grounds newly provided for it by the carcasses of seals which were lying about. They soon detect these, and assemble a few hundred yards away

Fig. 2.



Rookery of *Ossifraga gigantea* in Azorella.

on the water, afterwards approaching singly, little by little, with due caution. They seem to feel safer with both wings held in a crescent form, for they can thus sooner get away with

their bulky bodies ; and their wings are held in more varying attitudes than is the case with any other bird observed here. When frightened from the carcasses they run off as quickly as their legs will carry them to the water, then swim a short distance, and either fly or swim farther out, in a flock of from 40 to 60 birds. I do not incline to the belief that these birds have gorged themselves so much that they are incapable of flying, because many times, in the rookeries by the water's edge, I have noted them to act in this manner when they had not fed for an hour or more. Certainly, when they have worked head and shoulders into a seal's carcass and have become bespattered with blood, they object to fly unless hard pressed ; but my observations lead me to consider that not flying when quietly driven along the ground is due to their habits rather than to satiety. They vomit freely when frightened. Mr. Gundersen and I, one day, came suddenly upon one that was isolated at the head of a very small bay with cliff-sides. The moment we appeared on one cliff, some 75 yards from it, the bird considered its passage cut off, and immediately started disgorging oily substances. After a short time, it rushed past us and swam out a long way. To see some forty sitting on the water, washing their heads after a seal-feast, is a striking sight, the birds seeming to be up and down just like a quantity of large brown corks ; and to get force for the head dip, a little jump is made by means of the feet. Unlike the Skua, these birds run away from the banquet when disturbed, and waddle into the water, remaining there until the stranger has gone.

Since the date of the expeditions to observe the Transit of Venus, the birds of Long Island have shifted their rookery from the S.W. to the N.E. end of it. Having ascended the short eastern summit, I noticed near the bottom of a wind-sheltered slope a fine colony. To commence with, I surprised two just below the crest, and they started running with wings outstretched but not flapping, and continued, with short stoppages, several hundred yards to the beach, keeping just ahead of me. Of the colony, some birds were sitting and others standing, a few with expanded wings, and others

essaying jumps on to *Azorella*-clumps of 2 feet in height. Several pairs, with stretched necks, appeared to be engaged in controversy, and occasionally a low squeaking noise was uttered. On first sight of me they moved toward the edge of the cliff; but when I sat down within 100 yards of them, they became more confiding, and many gradually approached me, not flying, and without noise. Both young and old seemed to be inquisitive, but a gun shot half a mile away would cause them to look shy for a minute. After a rest, which they often took by sitting down, they would come a little nearer. Occasionally a bird would fly over with a prolonged guttural croak. There were from 50 to 70 of them, and by appearances many young birds were already abroad at this date (January 7th). As I drove them to the beach I stumbled upon quite a strange sight: it was their rookery, and some twenty-one grey fledgelings, as large as full-grown Geese, were nestling among the scattered tussocks of *Azorella*. The nest was made by tearing away the soft stems of this plant and then sitting upon them.

On approaching a bird, which was always a few yards apart from its fellows, it would utter a low grunt, bite, and stand upon the defensive, ejecting a quantity of oily matter that would ruin almost any suit of clothes. The adults preferred to run along the cliff-top rather than fly, and I drove them like any other fowls. They have no confidence in taking wing from the land, but do so at once on reaching the water. This rookery faces the entrance to Royal Sound, and is about 200 feet above sea-level. The birds possibly lay in September. The nests, some 3 feet in diameter, are merely hollows among the broken stems of *Azorella* and in the sand, and in the former the young are partially hidden and sheltered. The rookery extended for some 200 yards.

I found several young birds which had just lost their grey down, and had assumed a shining black plumage, a phase on which I know of no observations. I do not see why this coat should be exchanged later on for what is a very poor one in comparison. I also saw this black phase 800 miles east of Kerguelen, on the return to home (February 22nd).

Near Accessible Bay on February 8th I observed many young birds nearly ready to fly. In their stomachs I found the tongues of Prions and Penguins.

DAPTION CAPENSIS (Linn.); Salvin, Cat. B. xxv. p. 428.

The Cape Pigeon is a fearless bird. In Greenland Harbour I observed them in flocks of from 20 to 30, and at Accessible Bay I found their nests. When seal-skins were being towed by the small boat, a flock of seventeen would sit on the water around the floating skins and vigorously peek at their edges to get as much fat as possible, using all their energy in the work, and "clucking" rapidly and tremulously.

In the flock seen at Greenland Harbour all the birds seemed to be mature, and the young must either have been still in their nests, or had moulted thus early into full dress. At Accessible Bay (Betsy Cove) on February 7th I observed four nests, each with one young one partially covered with down. The nests were in the cavities of a rough cliff, and were simply hollows, without any attempt to place weeds in them. I saw two adults sitting in a sheltered nook, without egg or young; and one of these birds was placing little stones, one by one, around it with the bill, as if to make the nesting-place comfortable. The instinct of the bird evidently is to collect something to make a nest, but it is almost lost, and the few stones in all the nests were of no use, so far as I could see. These cavities or grottoes (approximately $6 \times 3 \times 3$ feet) were about 50 feet above sea-level, and by stooping I could get inside them, except in one case. A little climb brought me to an old bird, which clucked and made its trill; and I surprised another on its nest, but it did not fly, though it vigorously defended its young, and jumped backward and forward. I kept at a respectful distance from the young one, as it had an unknown supply of oily matter. In each of these nests was a young bird, partially in down, about as large as the parents, and in the daytime each of them was attended by one parent. The young may be described thus:—Length 12·75 inches: down, generally greyish above, greyish white below; bill black.

In Royal Sound I saw this species only twice, and then because a strong wind seemed to bring in many Petrels of several kinds.

PRION DESOLATUS (Gm.); Salvin, Cat. B. xxv. p. 434.

Most naturalists and whalers speak of the Prions as "Whale-birds," but if the countless numbers of this dove-like species round Kerguelen had to subsist on whale's droppings they would starve. I have seen them at 7 P.M. pass into Royal Sound in a glistening white line miles long. I watched them on January 7th from 6.30 to 7.30 P.M. travelling like a line of innumerable snow-flakes in a westerly direction for their island home. It was an extraordinary sight while the sun poured its light upon the current of feathered life. Other Petrels were doubtless there, but the "under-whites" predominated. When the line started I could not say, but it ceased at 7.30 to be seen without the sun's direct light, and I did not again encounter a view. Early on the morning of December 26th, some 60 miles east of Cape Digby, we saw thousands on the glassy sea after the storm of the previous day. They rise from the ocean much like a flock of Starlings, but while the latter are conspicuous black objects, the former are silvery white.

I found that both sexes take part in incubation in the daytime in the tunnels beneath the ground. As many as three birds to one egg were seen in one hollow. Of thirteen examined, I found three were males and ten females, and all were taken off the eggs in the daytime. Two females struck against the ship's light one night, so probably the males were then sitting. From these notes I concluded that the females sit principally in the daytime. Although the nests are usually placed beneath the ground, I found one in a hole in a solid rock at an altitude of, at least, 300 feet above sea-level. By some means it was bored horizontally, and at the further end it was occupied by a sitting Prion, quite observable from without. Abundant evidence along the floor showed former occupation by rabbits (January 24th). The bowl of

the nest has usually a few or many stalks of coarse seaweed in it, and in the centre several fresh stems of limp grass (*Cotula*), picked off for the purpose. Throughout January the eggs were fresh, and only two or three in thirty were much developed. In one nest I found two eggs: one was decomposed inside, caked with damp earth on the shell, and partly hidden in roots; the other was 3 inches away, with the sitting bird upon it (February 14th).

Once only did I notice an egg placed at the entrance of the tunnel. This was on January 26th, and it was fresh inside, but showed a little age outside. A Skua would probably have taken it, but for the environment of weathered shells, and I feel surprised that the Skua was outwitted. These eggs vary from clear white when fresh to a uniform dirty loam when hard-set. In one case a zone of deep brown encircled the egg, leaving the poles clear. In another several green blotches were at one end, as if caused by the succulent grass. A third egg was uniformly smudged with brown over a white base. I consider that all these eggs had originally a clear white ground-colour. The measurements ranged from 0.85×0.4 inch to 1×0.4 .

In most characters my seven examples agree with the descriptions of authorities, but I find that the posterior lamellæ are visible when the bill is closed upon a profile-view; while, in the living bird, a small portion of the nail is sometimes pale yellow; this area is a little longer than broad (December 27th).

PELECANOIDES EXSUL Salvin, Cat. B. xxv. p. 438.

Pelecanoides urinatrix Coues & Kidder, and others.

We occasionally saw small flocks of this Petrel in Royal Sound and Greenland Harbour, and at first we thought they were ducklings off shore. By exposing the ship's light on a dark night the specimens obtained were attracted on board. One I released, when it fluttered some 50 yards, then dived, and we saw it no more. A female came on the deck in the dark hours with its white feathers dirty to their bases.

PYGOSCELES TÆNIATUS (Peale).

Pygosceles papua Grant, Cat. B. xxvi. p. 631.

Fifty miles east of the island we were met by Penguins, and, nearer in, this species was to be seen jumping clear of the water, an element in which it is exceedingly rapid, though a slow creature on land. In their rookery these birds may be seen resting, often with the bill tucked between the flipper and the body (mostly the left flipper), while others are upon the ledges, resting upon the front part of the body. I noticed that these Penguins had an objection to going into the water when spending the afternoon on land, and when I have driven them down to the edge of a receding wave, they would rush to get back before its return. Their voice is peculiar, the expiration being several harsh notes like the bray of a donkey, while the inspiration is a trumpet-like call. I quite endorse the remarks of other writers respecting the courage of this bird, for I have seen it drive away a Giant Petrel that wanted to intrude on a company of five upon the hill-side.

In the early part of January the companies contained a large portion of young birds as large as the parents, and in one group I noted 21 young in care of nine adults. In the immature bird the white band does not extend over the head, while the bill and feet are not so markedly red. The parent regurgitates food, and the young bird thrusts its bill into that of the older one, and withdraws sustenance, after which it reposes at full length on its belly. Between Accessible Bay and Mount Campbell (February 7th) all the species had assembled in countless thousands, and still the annual mobilization was going ahead, for the breeding-grounds were not yet tenantless on February 10th, and for a week or more recruits continued to arrive. For three-quarters of a mile in length, and with a depth of 30 yards, these birds were packed; while, parallel with this mass, in two parts, a rookery of the Great Albatross, containing about a hundred nests, occupied the background.

EUDYPTES CHRYSOLOPHUS (Brandt).

Catarrhactes chrysolophus Grant, Cat. B. xxvi. p. 641.

I secured one specimen of this species only, and that

in Royal Sound, on December 27th. It had an inflammation under the base of one flipper, and one web of the right foot was torn.

EUDYPTES CHRYSOCOME (Forster).

E. saltator Sharpe, Phil. Trans. clxviii. p. 160, pl. viii. fig. 1.

Catarrhactes chrysocome Grant, Cat. B. xxvi. p. 635.

I interviewed the "Rock-hoppers" of four rookeries, and observed that some of their notes were soft and low, as a prelude to a high key being struck. While the voice of the adult is generally guttural, the young bird utters a single piping note. On Murray Island the rookery contained some 160 birds, one half sitting upon two eggs, the mates in most cases standing alongside the sitters (January 2nd). On dissection it was proved that males took part in incubation. With the exception of two nests (in which the nestlings were very young), most, if not all, contained eggs with much-developed chicks, two to each clutch. The eggs agree with the description of those of the Rock-hopper of New Zealand in Buller's 'Birds.' The average measurements were 2.65×2.35 inches. The nests were composed of collected shingle, and apparently slightly raised, many being plastered in a rough way. Their diameter was approximately 7 inches. While taking photographs of these Penguins, I found them to be fairly good sitters, and I even tried means to get some badly positioned birds into better places.

My first acquaintance with the young was on January 2nd, when they were but a few hours old.

Stage *a*. Down light black above; ventral surface white below; head and throat intense black; flanks greyish; wings grey; bill—proximal end black, distal end yellowish white. There is a marked ridge along the abdomen.

On February the 8th, in Accessible Bay, two further stages were observed in the rookery. Although they had not the agility to hop into view and out of sight, like their parents, they moved by hopping, displaying care. On my appearance in the rookery, seven or eight of the young in front of me huddled together, and one old bird seemed to

drive them into a corner by pecking. This made an excellent photograph.

Stage *b*. When in close down, about half-grown, the young is brownish black on the back, throat, under tail-coverts, and head; from the lower throat to the vent cream-white, deepening in the abdominal region; bill black, except the sides of the distal ends of the mandibles, which are greenish yellow; legs and feet chalky white in front, except the webs between the middle and outer toes, which are dark, blackish brown behind; nails dark horn-colour.

A third stage, which I observed in this rookery, corresponds with *E. chrysocome*, and perhaps belongs to the latter. There were several examples, and I feel inclined to consider it an intermediate stage; but among all the specimens seen I could not find connecting links to thoroughly satisfy myself on this point. I was rather surprised to find, as early as January 2nd, one of this stage among 160 full-grown *E. chrysocome* in the rookery at Murray Island. Why was it there by itself, among birds sitting on eggs? While preparing the skin of this bird (a male), I found it was not fatty like an adult Penguin.

APTENODYTES PENNANTI Gray.

Aptenodytes patagonica, Grant, Cat. B. xxvi. p 627.

King-Penguins were met with by us in all the harbours we visited, and I noted them singly or in companies of about six to nine birds. Upon the open coast our field-glasses showed great numbers in association. In the early part of January they had either concluded their moult or were undergoing it. One I saw was standing against a prominent rock, quite a mile apart from any others, and inland 200 yards from the head of a fjord, some six miles from the entrance. Feathers were strewn thickly about, and its flanks were bare. It objected to move on by order of a stranger, and needed pushing before it would shift its position. This is usually so when the bird is solitary, or if it moves it does so sluggishly; but birds in company are more active and shy, and will run well if driven when disturbed; the

birds which are lying down jump up instinctively, and all huddle together. I moved a group of five as gently as possible with my foot, and one individual tumbled into the soft mud two feet below a bank, where it lay for several minutes, while its companions walked away to the beach, avoiding the freshwater-pools, into which they might have plunged and made more rapid progress. A few minutes later I returned just in time to see it ascending on all fours, continuing the amble until out of harm's way.

The delicate and conspicuous colours of the lower mandible show gradations. In a group of nine I noted on February 2nd:—(a) black; (b) ivory-white; (c) fleshy to coral-red. (a) had finished its moult, and seemed to be a young one, with a rich golden-yellow lateral mark on the neck. (b) was a bird of ordinary proportions, with a coral-red patch on one side of the mandible at the distal end. (c) was a moulting bird, but with nearly double the girth of others of the same height, and was apparently one-third heavier. Instead of golden yellow on its neck, it had white, feebly tinged with yellow, and there was no gold line on the chest. I am inclined to think that the colour-development goes from black to red. In skinning these birds I noticed the dorsal fat, where the feathers were black, was black, and in the ventral region, beneath the white feathers, the adipose tissue was white. In young birds the down remains longest on the neck and flippers, and the whole plumage is not so bright as that of the adult. The head and throat are grey, instead of black, in the mature bird.

II.—*Notes on the Birds of North-west Fohkien.*

By J. D. D. LA TOUCHE, C.M.Z.S.

[Continued from 'The Ibis,' 1899, p. 431.]

110. PYRRHULA NIPALENSIS Hodgs.

This Bullfinch was common enough during the first two weeks of our stay at Kuatun, where we found it in small flocks; afterwards it apparently became scarce. Only two were shot in May.